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(54) Illuminated sign

(57) An illuminated sign for use in an emergency comprises an array of low-power light emitting devices in an array configured so as to form alphabetical characters which spell out a predetermined message. The devices may be light emitting diodes, and may be included in a casing suitable for positioning near a rear window of a vehicle. The sign may be connected to the electrical system of the vehicle so that a number of the devices illuminate when the brakes are applied.

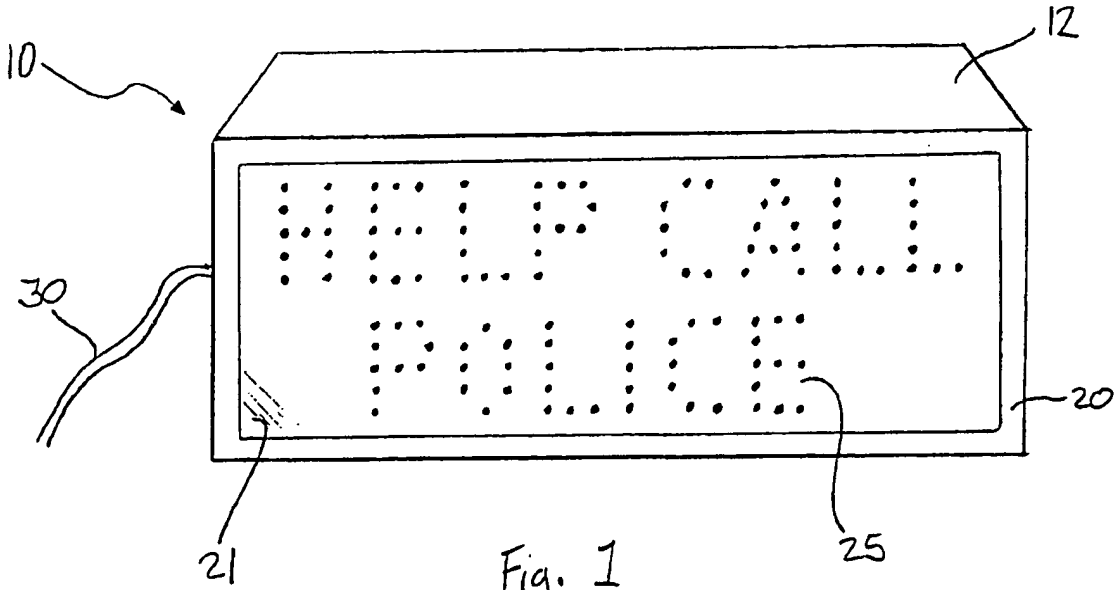

Fig. 1

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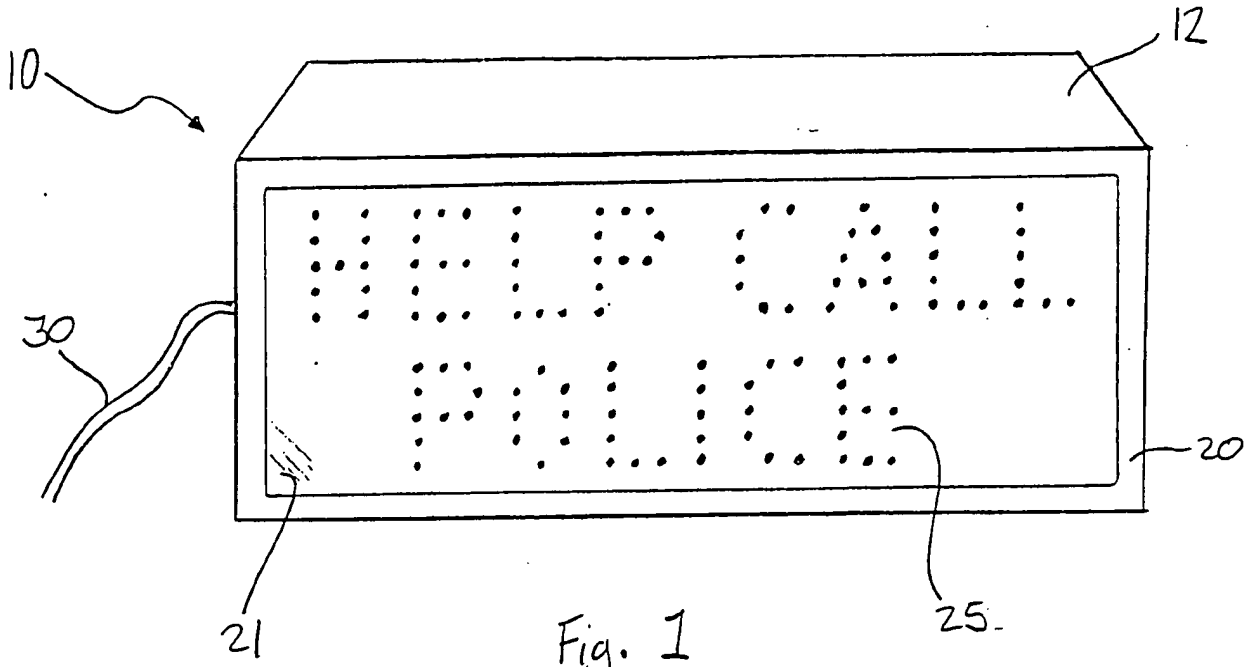

Fig. 1

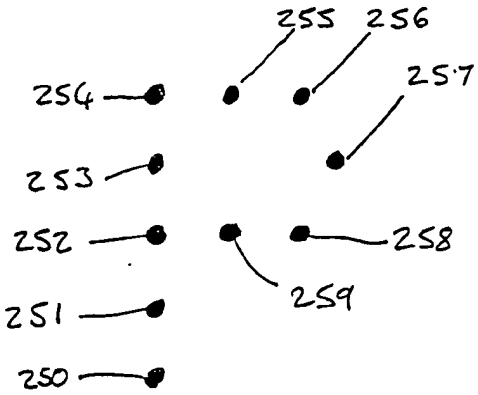

Fig 2a

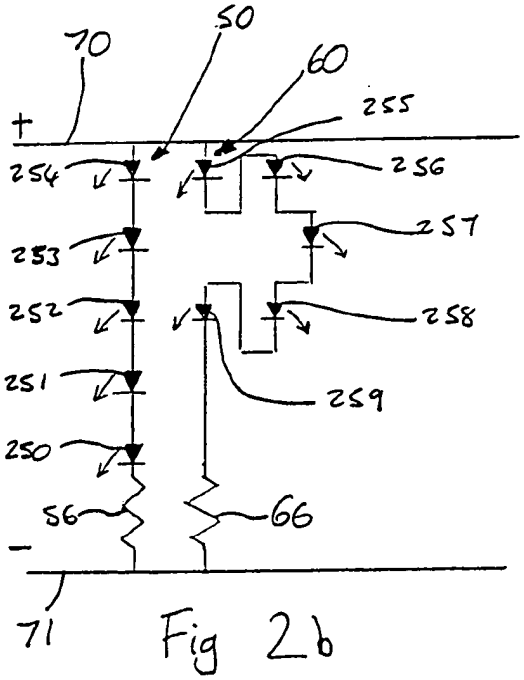

Fig 2b

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"Illuminated Sign"

The present invention relates to an illuminated sign and especially but not exclusively to an illuminated sign for use in an emergency.

For people in emergency situations it is often of critical importance to be able to summon help quickly, easily and effectively. For example, in the case of a car breakdown, especially at night, drivers, and in particular female drivers, are advised to stay in their cars and await assistance. They may, however, be unlikely to do so unless they believe that assistance is on its way. Paper emergency signs bearing appropriate messages are available and may be displayed in order to summon help. Such signs generally comprise fluorescent posters which are usually stored in the boot of a car and displayed in the rear window in an emergency. Storage of such a sign in the boot of a car often soils or damages the sign, decreasing its visibility or making it difficult or impossible to display effectively. In addition, in order to display such a sign, it may be necessary to leave the interior of the car in order to retrieve the sign from the boot. Also, such signs rely on ambient illumination in order

to be visible.

Other emergency situations in which it may be necessary to summon help quickly, easily and effectively include domestic situations in which an elderly person may suffer an injury and need to call help. Systems which allow remote operation of telephones in order to summon help are well known but are expensive to purchase and maintain.

Illuminated signs are frequently used for advertising purposes, and include signs of the type which include characters formed from arrays of light emitting diodes apparently moving across a display. Such signs require a considerable amount of power for their operation, are expensive and contain a large number of light emitting diodes a majority of which are not illuminated at any given time. Furthermore, the intensity of light provided by such displays tends to be low because of the electronic multiplex circuitry required to operate the display in order to create the apparent motion of the characters.

According to the present invention there is provided an illuminated sign comprising a multiplicity of low-power light output devices configured in an array which approximates the shape of alphabetical characters.

Preferably, said characters, the shapes of which are approximated by said array of light output devices, are arranged so as to spell out a predetermined message.

Preferably, the low-power light output devices are light emitting diodes.

Preferably, the light output devices are mounted on a

circuit board.

Preferably, a plurality of light output devices are connected electrically in series to form at least part of an alphabetical character.

Preferably, the sign comprises several groups of light output devices, the devices in each group being electrically connected in series.

Preferably, at least one group of series-connected light output devices is also connected in series with at least one resistor, selected to provide the desired voltage across each light output device of said group.

Preferably, the light output devices are arranged substantially in a plane.

Preferably, the light output devices are contained in a casing, said casing including a light transmissive wall portion so that light emitted from said light output devices is visible from outside said casing.

Preferably, the light transmissive wall portion comprises a coloured filter having a high degree of transparency to light emitted from the light output devices and a substantially lower degree of transparency to other colours of light.

Preferably, the light output devices are adapted to be automatically and repeatedly switched on and off.

The casing may be of a size and shape such that it is suitable for situation on the rear windowsill of a car or for attachment to the rear windscreen of a car.

Preferably, the sign is adapted to be connected to the electrical system of a car and is provided with a predetermined number of light output devices which are adapted to provide illumination when the brakes of the car are applied.

Preferably, the sign is designed or adapted to be connectable to and powered by a wet or dry cell or battery.

Embodiments of the present invention will now be described, by way of example, with reference to the accompanying drawings in which:

Fig.1 is a front perspective view of an embodiment of an illuminated sign in accordance with the present invention;

Fig.2a illustrates the configuration of a letter P in the sign of Fig.1; and

Fig.2b is a schematic circuit diagram corresponding to the configuration illustrated in Fig.2a.

Referring to the drawings an embodiment of an illuminated sign, generally designated 10, comprises a generally rectangular casing 12 having five substantially plain faces and having a display face 20. Said display face 20 includes a red-transparent filter 21 behind which is located a display array 25 in the form of an array of red, high intensity, wide angle, light emitting diodes (LEDs). The arrangement of the LEDs in the array gives the appearance of characters spelling the words of a request for help. The red-transparent filter serves both to protect the LEDs and

to enhance the visibility of the LEDs when they are illuminated. The sign is also provided with a wire 30 via which it may be connected to a power source, for example, plugged into the cigarette lighter socket in a car (not shown) when illumination of the sign is required, or permanently wired into the electrical system of a car. The sign also includes a switch (not shown) to allow it to be switched on and off.

The display array 25 of LEDs is economical in construction because the sign is adapted to display a single, predetermined message. Thus, only the number of LEDs required to form the said message is required. This is in contrast to signs including moving message displays which are designed to display any message required and which are provided with a grid-like array of many LEDs, a majority of which are not illuminated at any given time during the display of a given message.

Fig.2a illustrates the configuration of part of the display array 25 of LEDs which gives the appearance of a character P. In Fig.2a a total of ten LEDs designated 250 to 259 are used to form the character. However, alternative configurations for any given character could employ different numbers of LEDs. In the illustration of Fig.2a, widely available substantially round LEDs are shown, but different types and shapes of LED could be used without departing from the scope of the invention. Although, as in the configuration illustrated, the LEDs 250 to 259 demarcate points on the outline of a given character, it will be appreciated that when the LEDs are illuminated the character will be easily recognised.

Fig.2b is a schematic circuit diagram illustrating the

electrical connections of a part of a display array 25 of LEDs having the configuration illustrated in Fig.2a. Groups of LEDs are connected in series in order to restrict the power required by the sign.

The configuration of LEDs forming the character comprises a first group 50 of LEDs connected electrically in series and a second group 60 of LEDs also connected electrically in series. The two groups 50, 60 of LEDs are connected in parallel across first and second electrical supply lines 70, 71, between which there is a potential difference. The LEDs shown in Fig.2b correspond to those shown in Fig.2a and are designated by corresponding reference numerals.

The first group 50 of LEDs comprises five LEDs 250, 251, 252, 253, 254, mounted on a circuit board (not shown) in a substantially straight line in order to form the upright of the letter P. The first group 50 is also connected in series with a resistor 56.

The second group 60 of LEDs comprises five LEDs 255 256, 257, 258, 259 mounted on the circuit board (not shown) so as to form the upper curved portion of the character P. The second group is also connected in series with a resistor 66.

The resistors 56, 66 are included in order to ensure that the required voltage is applied across each of the LEDs 250 to 259 for a given voltage between the electrical supply lines 70,71.

Because there are five LEDs in each of the two groups 50, 60 illustrated, the two resistors 56, 66 should have the same value. If, however, a group forming part of a character comprised fewer LEDs, then a resistor

with a higher resistance would be required, and conversely, a resistor with a lower resistance would be required for a group including a greater number of LEDs.

Because the display array 25 of LEDs is configured to display specific predetermined characters, the characters may be easier to read and less stylised than characters formed by a LEDs on a grid-like array designed to be selectively illuminated in order to display any of a variety of different letters.

The described embodiment thus provides an illuminated sign, suitable for use in emergency situations and adapted to be located in, and visible through, the rear window of a car. The described embodiment is sized approximately 10.5 inches by 4 inches by 2 inches.

A similar sign could be used for location in a visible window of domestic or business premises in order to allow occupants of the premises to signal for help. In the case of domestic use the sign could additionally be switched on by radio frequency remote control using a switch located on the occupant's person. The sign could be linked to an audible alarm in order to attract additional attention. Signs for use in premises could effectively be run from the mains using a suitable (for example 12 Volt) transformer.

A sign permanently wired into a car could include, as part of the display array, a chain or block of LEDs (or an additional light output device) adapted to illuminate upon illumination of the brake lights of the car. Such a sign would thus provide the additional, and considerable, benefit of acting as a high level brake light, as well as an emergency sign.

Both premises-based and vehicle-based signs could be provided with batteries in order to provide power to the signs in the event of failure of the normal power source, such as a power cut or electrical failure of the car's electrical system. Batteries would provide a considerable amount of operating time for such a sign because of the sign's low power consumption. Typically, a sign of this type would require a supply of about 250 mA at 12 V.

In order to enhance visibility of the message displayed it is also envisaged that embodiments of the present invention could be capable of causing the display to flash. This could be achieved by use of a circuitry integral to the sign or, in the case of a sign located in a car, by utilisation of part of the car's electrical system which operates the hazard warning lights.

Described embodiments of the present invention thus provide illuminated signs which are economical to produce, have good visibility in a wide range of lighting conditions both from a distance and from a wide range of angles, have low power consumption, may flash so as to cause a message displayed to be still more conspicuous, and may provide the additional function of acting as a high level vehicle brake light.

The embodiment of the present invention illustrated is an illuminated sign bearing the message "HELP CALL POLICE" formed by an array of red LEDs and including a red transparent filter. Clearly different messages and/or different colours of LEDs and filters could be used.

The casing is described and illustrated as being

generally rectangular, but different shapes of casing could be used, including a casing with an inclined display face, configured such that the display face could be parallel to an adjacent part of the rear window of a car whilst the array of LEDs remains substantially vertical. Such a casing might be of the same general shape as the casing of known rear window mounted brake light assemblies. A sign with a casing shaped in this way would be well suited for attachment directly to the rear window of a car.

Improvements and modifications may be incorporated without departing from the scope of the invention.

CLAIMS

1 An illuminated sign comprising a multiplicity of low-power light output devices configured in an array which approximates the shape of alphabetical characters.

2 An illuminated sign as claimed in Claim 1, wherein said characters, the shapes of which are approximated by said array of light output devices, are arranged so as to spell out a predetermined message.

3 An illuminated sign as claimed in either preceding claim, wherein the low-power light output devices are light emitting diodes.

4 An illuminated sign as claimed in any preceding claim, wherein the light output devices are mounted on a circuit board.

5 An illuminated sign as claimed in any preceding claim, wherein a plurality of light output devices are connected electrically in series to form at least part of an alphabetical character.

6 An illuminated sign as claimed in any preceding claim, wherein the sign comprises several groups of light output devices, the devices in each group being electrically connected in series.

7 An illuminated sign as claimed in any preceding claim, wherein at least one group of series-connected light output devices is also connected in series with at least one resistor, selected to provide the desired voltage across each light output device of said group.

8 An illuminated sign as claimed in any preceding claim, wherein the light output devices are arranged substantially in a plane.

9 An illuminated sign as claimed in any preceding claim, wherein the light output devices are contained in a casing, said casing including a light transmissive wall portion so that light emitted from said light output devices is visible from outside said casing.

10 An illuminated sign as claimed in Claim 9, wherein the light transmissive wall portion comprises a coloured filter having a high degree of transparency to light emitted from the light output devices and a substantially lower degree of transparency to other colours of light.

11 An illuminated sign as claimed in any preceding claim, wherein the light output devices are adapted to be automatically and repeatedly switched on and off.

12 An illuminated sign as claimed in any preceding claim, wherein the casing is of a size and shape such that it is suitable for situation on the rear windowsill of a car or for attachment to the rear windscreen of a car.

13 An illuminated sign as claimed in any preceding claim, wherein the sign is adapted to be connected to the electrical system of a car and is provided with a predetermined number of light output devices which are adapted to provide illumination when the brakes of the car are applied.

14 An illuminated sign as claimed in any preceding

claim, wherein the sign is designed or adapted to be connectable to and powered by a wet or dry cell or battery.

15 An illuminated sign substantially as hereinbefore described with reference to and as shown in the accompanying drawings.

Patents Act 1977 Examiner's report to the Comptroller under Section 17 (The Search report) -13-	Application number GB 9422398.9
Relevant Technical Fields (i) UK Cl (Ed.M) G5C (CDBX, CEJ, CFF) (ii) Int Cl (Ed.5) G09F	Search Examiner R A H CASLING Date of completion of Search 12 DECEMBER 1994
Databases (see below) (i) UK Patent Office collections of GB, EP, WO and US patent specifications. (ii)	Documents considered relevant following a search in respect of Claims :- 1-15

Categories of documents

X:	Document indicating lack of novelty or of inventive step.	P:	Document published on or after the declared priority date but before the filing date of the present application.
Y:	Document indicating lack of inventive step if combined with one or more other documents of the same category.	E:	Patent document published on or after, but with priority date earlier than, the filing date of the present application.
A:	Document indicating technological background and/or state of the art.	&:	Member of the same patent family; corresponding document.

Category	Identity of document and relevant passages		Relevant to claim(s)
X	GB 2180383 A	(BAKER) see page 1 line 63 et seq	1-11 at least
X	GB 2164189 A	(RASHIDI) see page 1 line 6 et seq	1-4,8,9, and 11 at least
X	EP 0214594 A2	(CLINKER) see page 6 line 1 et seq	1-4,8-10, 12-14 at least
X	WO 87/06753 A1	(FOSTER) see page 7 line 26 et seq	1-6,11-14 at least
X	WO 86/00858 A1	(JERANCH) see page 6 line 13 et seq and page 10 line 21 et seq	1-3,5-8, 11,13,14 at least

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